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Readying Michigan To Make Good Energy Decisions

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Governor's Special Message *Ensuring Our Future: Energy and the Environment*

Governor Snyder is right to look for opportunities to provide clean, reliable energy and a sustainable environment to protect Michigan for current and future generations. Covanta Energy applauds the Governor for undertaking a review process that is both deliberate and inclusive. No one's interest is served by rushing to a conclusion without a thorough review of all the facts. Relating to energy, in his Special Message, the Governor laid out four principals for making energy decisions: adaptability, reliability, affordability and environmental responsibility. Regarding the environment, he wants to increase the state's recycling rate, which has been stuck at 20%, well below the national average of 34%.

While there are many ways to generate clean, reliable energy and increase recycling, there is only one solution which can accomplish both at the same time. Covanta believes that an increased use of Energy from Waste will help meet all of these goals.

Background

There are several issues which must be considered when reviewing the state's RPS which, although not directly related, will be impacted by decisions made regarding the RPS.

Covanta Energy

Covanta Energy is an internationally recognized owner and operator of Energy-from-Waste (EfW) (also known as waste-to-energy or WTE) and renewable energy projects and has provided reliable and sustainable municipal solid waste (MSW) management to communities since 1986. Covanta

operates over 40 state-of-the-art facilities that convert everyday trash into clean, renewable energy for communities around the world. Covanta's North American facilities supply electricity for approximately 1 million homes. EfW-generated energy is renewable because the MSW used in the process is consistently replenishable and all of the energy recovered by the EfW process preserves natural resources and avoids secondary impacts from mining and the combustion of those resources

Renewable Portfolio Standard

Passed in 2008, Michigan's Renewable Portfolio Standard (Public Act 295) ("RPS") calls for 10% of the state's energy production to be from renewable sources by 2015. As stated, the purpose of the act looks to promote the development of renewable energy that will:

> (a) Diversify the resources used to reliably meet the energy needs of consumers in this state.
>
> (b) Provide greater energy security through the use of indigenous energy resources available within this state.
>
> (c) Encourage private investment in renewable energy and energy efficiency.
>
> (d) Provide improved air quality and other benefits to energy consumers and citizens of this state.

Michigan electric providers comply by using renewable energy credits ("RECs") starting in 2012, and the law requires that the RECs be sourced from within the State of Michigan, with certain exceptions. Under the RPS, the three existing Michigan EfW plants qualify as renewable and can participate in the REC program. However, no new EfW plants could participate, meaning the RPS essentially "caps" EfW at the existing level. There is no such cap on landfill gas systems, and any new such system is allowed participate.

Climate Action Plan

Created in 2007, the Michigan Climate Action Council ("MCAC") was charged with producing a a comprehensive Climate Action Plan with recommended GHG reduction goals to address climate change. The MCAC's proposed GHG reduction goals for Michigan are to achieve a 20% reduction of GHGs below 2005 levels by 2020 and an 80% reduction below 2005 levels by 2050.

Solid Waste Policy

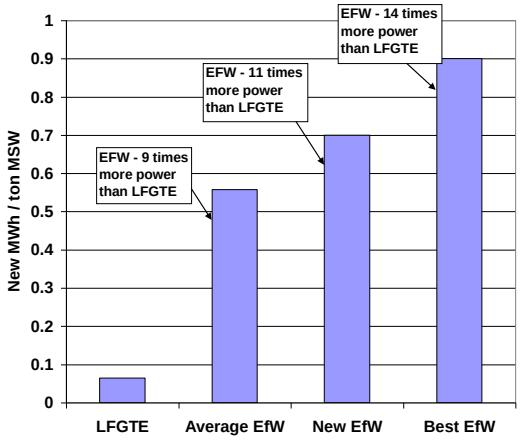
In 2007, the DEQ set forth the state's Solid Waste Policy, which encourages the state to view solid waste as a resource in a global economy. The Policy recommends that the state "strive to make continuous improvement toward full utilization of all solid waste streams, and as a step toward that end, establish a goal of utilizing 50 percent of Michigan's municipal solid waste (MSW) stream by 2015". Both an increase in recycling and increased use of energy from waste are included in this 50% goal.

Affordability - Michigan's RPS Is Encouraging the Inefficient Over the Efficient

The state's solid waste policy, which encourages EfW over landfilling, is unfortunately directly contradicted by the policy promoted by Michigan's RPS. As mentioned above, EfW is capped in the RPS. No new EfW plants, which would reduce the state's reliance on landfills, would be allowed to participate in the RPS. There is no such cap on landfill gas systems, meaning state energy policy is subsidizing the use of landfills.

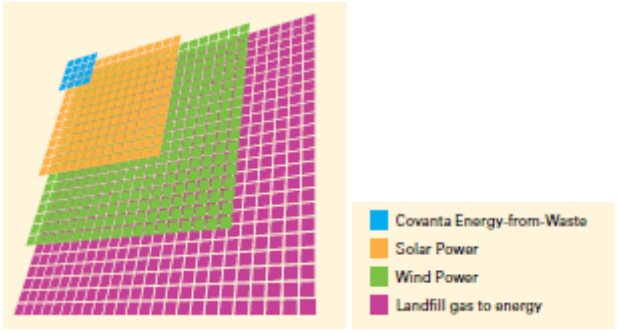
Given this perverse incentive, it is not surprising that Michigan is overly reliant on landfills. There are currently 70 active landfills in the state, where over 44 million cubic yards of waste were disposed of in Fiscal Year 2012. That is the equivalent of 14.8 million tons. Further, Michigan has the third highest rate of waste importation among the 50 states, importing almost 10 million cubic yards of waste in Fiscal Year 2012, the equivalent of 3.2 million tons. The continued incentivizing of landfills will result in the status quo: limited recycling, millions of tons of waste imported and a reliance on a waste disposal method (landfills) that the rest of the world is moving away from. Even with a gas recovery system, landfills are at the bottom of the internationally recognized solid waste hierarchy:

Landfill gas recovery systems energy efficiency is extremely low compared to EfW. The chart below compares landfill gas projects to EfW. The average existing facility generates *nine times* more power per ton of waste while the newest facilities can generate as much as *fourteen times* more power. This comparison was done using the exact same fuel, garbage.



EfW facilities produce 9 to 14 times the energy per ton compared to landfill gas.

Furthermore, EfW is one of the most efficient uses of land per megawatt (acres/MW) among the current renewable energy solutions. Covanta's facilities require an average of 0.7 acres/MW of electricity compared with 8 acres/MW for solar, 18 acres/MW for wind, and 27 acres/MW for landfill gas to energy based on average capacity over 30 years.

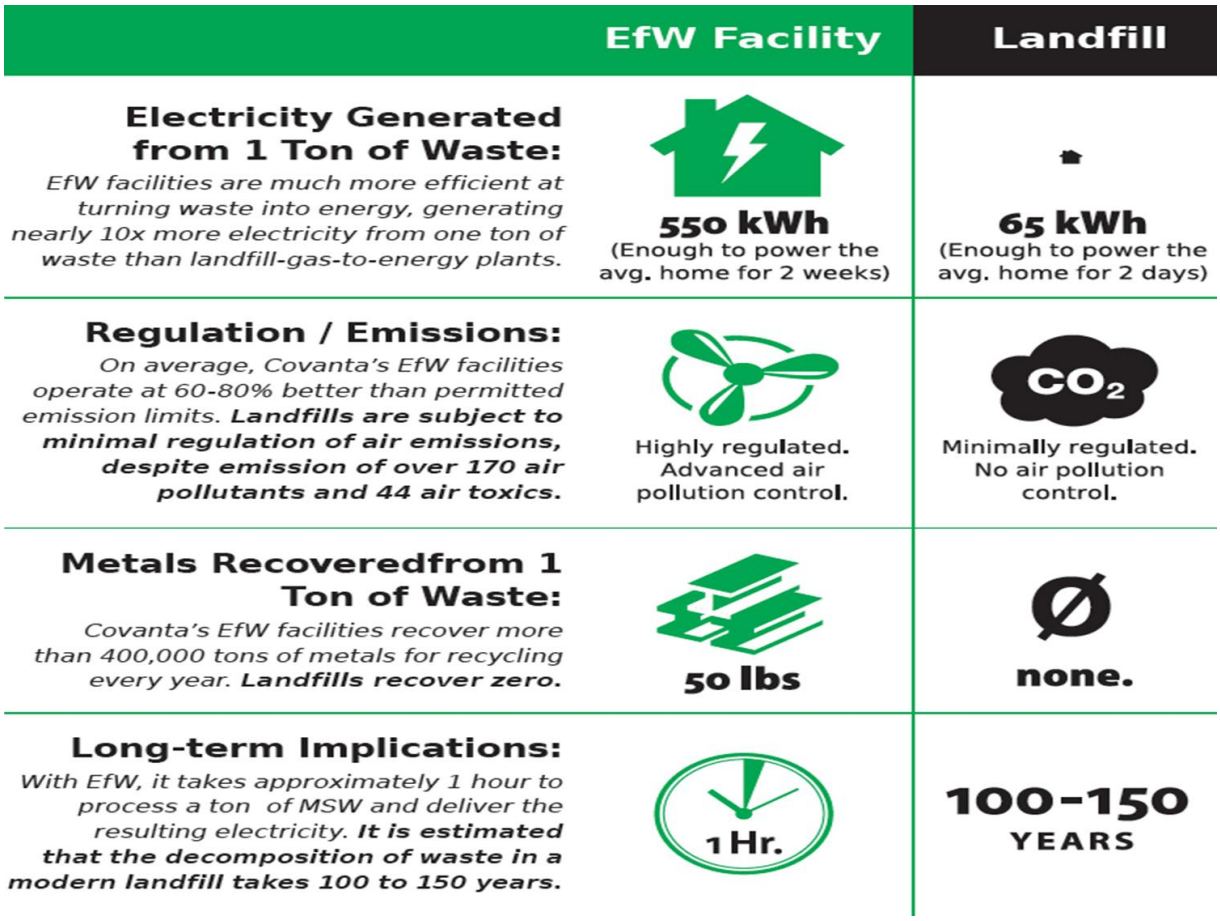


Land Required Per Megawatt

Furthermore, landfills are one of the largest sources of manmade methane (a GHG 25 times as potent as carbon dioxide over a 100 year time frame), and only a portion of that methane is collected and converted into electricity. The rest of it escapes directly into the atmosphere. While EfW facilities are "one of the cleanest sources of electricity" according to the US EPA, landfills have significant uncontrolled emissions, including 170 air pollutants, 44 of which are air toxics, including 4 known and 13 probable carcinogens, in addition to methane. Landfills present a significant risk of groundwater contamination from leachate created. In fact, at least 15 of the 86 US EPA National Priorities List sites in MI are landfills. Additionally, they also forever render useless significant acres of land.

EfW captures metals for recycling that would otherwise be lost in landfills forever. In 2012 alone, at least 370,000 tons of metal were lost to Michigan landfills, while Covanta alone recycled enough metal in 2011 to build 9 Golden Gate Bridges.

The chart below offers a quick comparison of the benefits of EfW over landfilling:

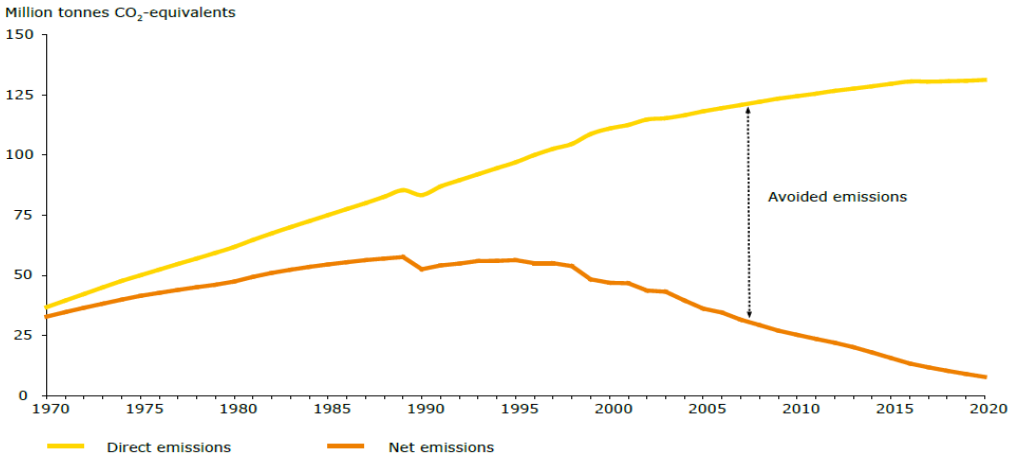


Environmental Responsibility - EfW is Internationally Recognized as a Key GHG Mitigation Technology

The objective of any RPS program is grounded, in part, by the recognized need to control, and dramatically reduce, GHG emissions. EfW contributes to the reduction of GHGs in the environment in three ways: (1) it provides electricity that otherwise would likely be generated by fossil-fueled facilities; (2) it results in the permanent disposal of solid waste that would have been destined for a landfill, where it would contribute to the emission of methane for years; and (3) it results in the recovery of metals for recycling.

A major contributor to GHG emissions is the uncaptured emissions of methane from landfills, a GHG that is estimated to be 25 times more potent than CO_2 on a 100 year basis, and 72 times more potent over 20 years. EfW technology avoids methane emissions -- a potent GHG -- entirely. Based on national averages, current EfW facilities avoid 1 ton of CO_2 for every ton of MSW processed, making EfW the only source of electricity that actually reduces GHG emissions.

Recognizing this, Germany, Denmark and the rest of the EU have adopted policies that have moved to phase out landfills and increase recycling and recovery of energy from waste. As a result of the EU waste policies, the largest relative reduction in EU greenhouse gas emissions has been achieved in the waste sector, with a relative reduction of 34%. This is due largely to the avoidance of the methane that is generated by landfills. The chart below demonstrates the current and projected reduction of GHG emissions from the management of municipal waste in the EU.



Source: ETC/RWM.

The EU Landfill Directive (1999) states that member countries have to reduce the biodegradable waste going to landfill to 35% of 1995 levels by 2020. This policy has been the single most effective way to achieve increased recycling and energy recovery which allowed the waste sector to achieve the highest relative reductions of greenhouse gases at 34%. EfW facilities, through an engineered controlled combustion process, eliminate all of the potential methane from waste disposal in landfills. Recognition of EfW as a source of GHG mitigation and inclusion of EFW as an eligible source of carbon offsets follows the long established policies of the Intergovernmental Panel on Climate Change (IPCC), the Clean Development Mechanism (CDM) of the Kyoto Protocol and the European Union. Here in the United States, the recent expansion of the Lee County Resource Recovery Facility in Florida is generating carbon offset credits under the Voluntary Carbon Standard. The World Economic Forum in its 2009 Davos Report identified EfW as one of 8 technologies likely to make a significant contribution for a future low carbon global energy future. The 2010 Davos Report reiterated their findings but also included a recommendation to follow the European Union's model and increase EfW by phasing out use of landfills because to bury waste in landfill is "increasingly considered environmentally unacceptable".

Given Michigan's goals stemming from the state's Climate Action Plan, it is key that the state end the practice of subsidizing landfills over EfW by correcting the RPS.

Reliability - Energy-from-Waste is Proven Technology

Energy-from-Waste is a proven technology that converts municipal solid waste into baseload steam and/or electricity. There are currently 86 such facilities operating in the United States, including three in this state. Covanta Energy operates one of those three plants, located in Grand Rapids, which employs 47 people with a $4.5 million annual payroll.

Additionally, EfW facilities supply power 365-days-a-year, 24-hours a day and average greater than 90% availability of installed capacity. EfW power is sold as "baseload" electricity to utilities that can rely upon its supply of electricity. It is not dependent on weather conditions that make other Class 1 power intermittent. Additionally, because these facilities are located both where the "fuel" is and where the demand for power is, they do not require additional, interstate transmission lines. They are, in fact, distributed generation facilities.

Energy-from-Waste is one of the lowest cost renewable energy sources. Further, when the Energy Information Administration Office of Coal, Nuclear, Electric, and Alternate Fuels examined subsidies received by all energy technologies, it is clear that EfW is the least subsidized, receiving *even less than fossil fuels.* EfW provides long term price stability for rate payers for both energy and waste disposal.

Adaptability - EfW and Economic Development

EfW can play a key role in economic development for Michigan. From a construction perspective, a new 1500 ton per day, 50MW facility would have a$1 billion economic benefit to the state. This includes the construction of the facility, which would create 825 direct and indirect Michigan jobs. Additionally, 110 permanent direct and indirect jobs would be created to operate and maintain the plant once constructed. The plant would provide significant tax and host fee benefits to the state and local communities.

If state would strive toward its goals in the Solid Waste Policy and divert 25% of the approximately 15 million tons of waste it landfilled in 2012 to EfW, the impacts would be significant. This would generate 373 MW of reliable, baseload, renewable electricity that would be **generated in Michigan**. This would create 6600 construction jobs and 880 full permanent, post construction jobs in Michigan. (It would also mean at least 92,000 tons of ferrous metal would be recovered every year.)

Increasingly, companies today are looking for options when it comes to renewable energy sources and waste disposal. EfW plays a critical role in both.

From an energy perspective, EfW provides baseload renewable energy that provides electricity 24 hours a day, 7 days a week and 365 days a year. It offers renewable electricity that is not intermittent like some other, weather based renewables. Michigan cannot run a manufacturing economy on intermittent power. EfW provides that baseload, renewable electricity that manufacturers need.

From a solid waste perspective, many companies today are looking to increase the "sustainablilty" of their operations. An important component of this is their ability to become "Zero Landfill" by managing their waste through recycling and EfW - avoiding landfills.

If Michigan continues to subsidize landfilling over EfW in the RPS, there remains a serious question as to whether Michigan will be able to deliver these options.

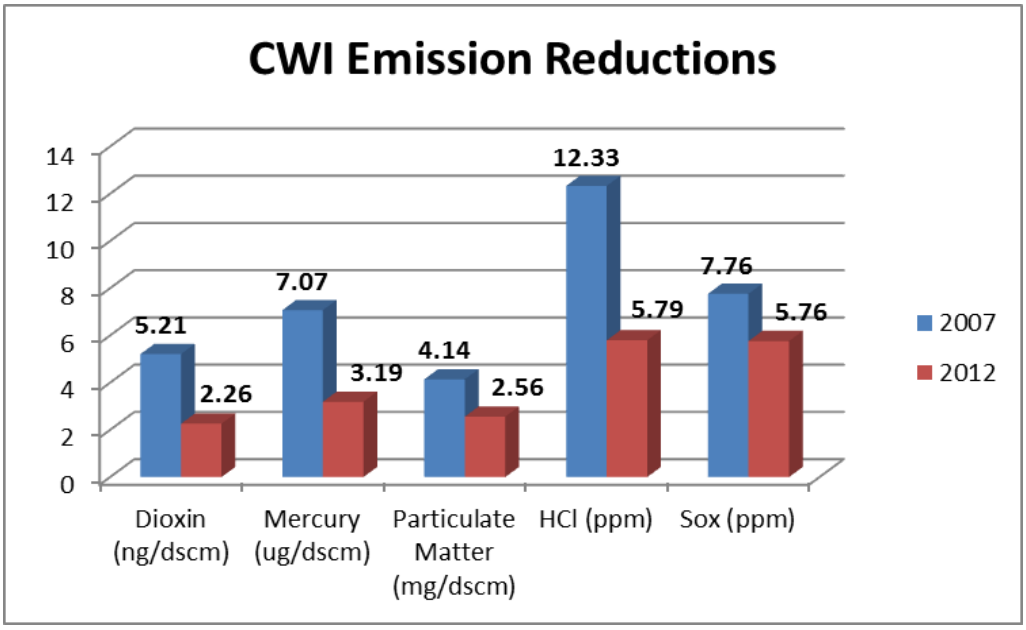
Environmental Responsibility - EfW Facilities Have a Proven Track Record of Strong Environmental Performance

The U.S. EPA states that EfW facilities produce electricity with "less environmental impact than almost any other source of electricity." Even though these facilities were built approximately 20 years ago, they employ the latest state of the art technology. The 1990 Clean Air Act included a provision that EFW facilities must comply with the Maximum Achievable Control Technology (MACT) standards. A 2007 memo from the US EPA stated that "**The performance of the MACT retrofits have been outstanding**." The table below is from that same EPA memo.

Pollutant	1990 Emissions (tpy)	2005 Emissions (tpy)	Percent Reduction
CDD/CDF, TEQ basis*	4400	15	99+%
Mercury	57	2.3	96%
Cadmium	9.6	0.4	96%
Lead	170	5.5	97%
Particulate Matter	18,600	780	96%
HC1	57,400	3,200	94%
SO_2	38,300	4,600	88%
NO_x	64,900	49,500	24%

Although NO_x emissions were reduced during the period, Covanta is introducing a new technology that it is installing at its facilities. The results of this technology have further reduced nitrogen oxide (NO_X) emissions dramatically. Covanta has two patent-pending processes: LN™ (low NOx) and VLN™ (very low NOx). LN™ involves modifications to the combustion air system combined with modifications to the combustion monitoring and controls systems to achieve substantial reductions in NO_x formation. This innovation was developed in Connecticut and Covanta's Bristol, Connecticut facility was the first in the nation to have this process installed.

In 2007, Covanta initiated its Clean World Initiative (CWI) in an effort to continue instituting state of the art pollution controls. The results have been very successful, with emissions being continually reduced.

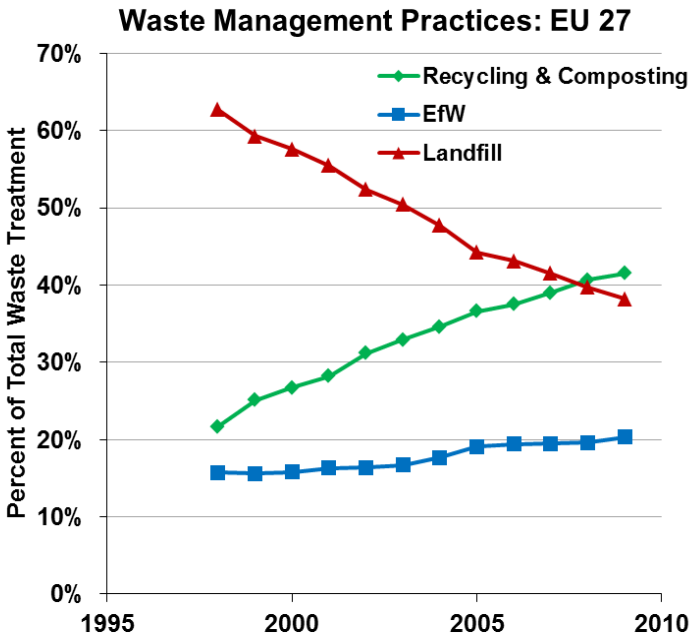


As a result of these and numerous other technological emission control improvements over the years, modern EfW facilities run about as clean as a natural gas facility.

Environmental Responsibility - Fixing The RPS Will Help The State's Recycling Efforts

As the Governor is looking to increase recycling, it becomes critical that the state's RPS policy mirror, and not contradict, the state's solid waste policy. Readily available data demonstrates domestically and internationally that communities that utilize landfills have much lower recycling rates than those that use EfW. In the US, a recent study proves that communities that use EfW have HIGHER recycling rates than the national average recycling rate: 33.2% vs. 27.8%.[1] Further, countries in Europe that have aggressively moved away from landfilling and concurrently increased their use of EfW have a vastly superior recycling rate as compared to the US overall, proving that the availability of cheap, state subsidized landfilling competes with recycling. As the below chart demonstrates, as Europe has moved away from landfilling and towards an increased use of EfW, the recycling rate increased dramatically:

[1] Berenyi, E.B., *Recycling and Waste-to-Energy: Are They Compatible? 2009 Update*, http://www.wte.org/userfiles/file/2009%20Berenyi%20recycling%20update.pdf



This objective data demonstrates that EfW facilities, as opposed to landfilling, stand alongside recycling efforts to form a critical part of an integrated solid waste management plan, exactly as contemplated by the solid waste hierarchy.

Further, EfW facilities recover tons of ferrous and non-ferrous metals that would otherwise sit in a landfill forever. As mentioned, in 2012 alone, at least 370,000 tons of metal were lost to Michigan landfills, while Covanta alone recycled enough metal in 2011 to build 9 Golden gate Bridges.

Making Good Energy Decisions

As 2015 approaches and the state meets its 10% goal, Michigan needs to look to the future to increase its RPS goals. It must do so in a responsible manner and ensure that the goals are achievable. Furthermore, the goals should ensure that power generated in Michigan is helping achieve these goals.

As Michigan evaluates its RPS, it must recognize the value of EfW. EfW can meet the Governor's four goals relating to energy: it is reliable, adaptable, protects the environment and, if the RPS is fixed, affordable. It can provide clean, renewable, baseload power generated in Michigan by Michigan jobs. EfW will help the state meet the needs of companies that are increasingly concerned

about sustainability. It will move the state towards increased recycling and less landfilling, meeting the goals of the state's Solid Waste Policy and the Governor's goal of increasing the state's recycling rate. By reducing the state's GHG emissions, EfW can move the state closer to meeting the goals established in the state's Climate Action Plan.

There is no other source of electricity that can meet all of these goals.

Michigan would not be alone if it moved toward making EfW a critical component of its energy and solid waste policies. In fact, a recent report by the Center for American Progress recognizes the many benefits offered by increasing the use of EfW and reducing reliance on landfills. That report specifically recommended **that states should ensure that their RPS programs are consistent with the solid waste hierarchy**. Michigan should follow suit to ensure that the state's energy policy does not undermine the state's solid waste policy.

Additional Resources

For additional information, the following resources provide information that is needed to make good energy decisions.

New York Times Article: "Europe Finds Fuel In Trash; U.S. Sits Back"
Excerpt From CBC Report: "Taxes in, Garbage Out"
Chart of the 50 states demonstrating EfW, Recycling and Landfilling Rates
Excerpt: World Economic Forum: "Green Investing 2010"
Kaplan, Decarolis & Thorneloe; "Is It Better to Burn or Bury Waste for Clean Electricity Generation?"
European Environment Agency Briefing: "Better management of municipal waste will reduce greenhouse gas emissions"
Center for American Progress: "Energy from Waste Can Help Curb Greenhouse Gas Emissions"
Excerpt: United Nations Conference on Sustainable Development